Exam/Procediure Light

Operation Manual

WELCH ALLYN

LS100 HALOGEN LIGHT

SERVICE MANUAL

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SERVICE MANUAL

FOR:

WELCH ALLYN

LS100 HALOGEN LIGHT
MODELS: 44100...Domestic
44110...Wall/Table mount

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4341 State Street Road
P.O. Box 220
Skaneateles Falls, NY 13153-0220
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This SERVICE MANUAL provides technical assistance to Welch Allyn repair technicians for diagnosing, repairing, and testing the **WELCH ALLYN LS100 HALOGEN LIGHT**. The manual's main content areas cover: troubleshooting, step by step repair, adjustment, and re-test procedures. The repair 'TASK' procedures (R & R .. Removal and Replacement) are written to provide quick and easy reference for repair technicians of different experience levels. Required specifications and materials are listed at each step where applicable. When reading this manual for the first time, have an LS100 readily available for reference and practice. Read each complete repair step on what to do (task statement), plus how to do it (technique statement) before starting the repair or practice.

Training for the LS100 should consist of detailed demonstrations of required repair tasks, practice on LS100'S using repair tooling and materials. Assess skill development through observation of trainee practice on actual equipment. Set up sessions to allow the trainee to practice the use of the diagnostic, repair, adjustment, and re-testing procedures found in this manual. The ability of the technician to develop and retain new skills is in great part dependent on well prepared training exercises. Each trainee must have the opportunity to practice the procedure(s) after it has been demonstrated by the instructor. More detailed background product information is found in the APPENDIX section and as such will be a critical element in a comprehensive service training program for technicians.

I M P O R T A N T :

Welch Allyn part numbers and 'M' (material) numbers appearing in this manual are for the purpose of familiarizing new technicians with Welch Allyn documentation conventions. Order replacement parts, as always, by referencing your latest bill of materials, parts catalog and assembly drawings. Part number changes, product updates, or new test procedures should be noted on the appropriate page of this manual by the manual owner. Notices announcing these changes should be attached to PRODUCT UPDATES APPENDIX.

HOW TO FIND CURRENT PART NUMBER INFORMATION:

REFER TO THE MOST RECENT ASSEMBLY DRAWING(S) FOR APPLICATION INFORMATION ON PARTS, PROCESS, AND MATERIALS. FIND THE CURRENT PART NUMBERS BY REFERRING TO THE CIRCLED NUMBERS ('BUBBLE' NUMBERS) ON CURRENT ASSEMBLY DRAWINGS. FIND CORRESPONDING PART NUMBER ON THE MANUFACTURING OR REPAIR BILL OF MATERIALS.

*** SAFE SERVICE ***

DISCONNECT power cord from A.C. power source before initial disassembly of LS100 Light. OBSERVE cautions / warnings in owners manual and printed on the product itself.

COMPLY with all safety codes and practices for this type of product. COMPLY with all safety regulations at your work place.

PERFORM all recommended Welch Allyn service test procedures to assure the LS100 meets all safety, performance and reliability requirements.

EXAMINE AND REPAIR OR REPLACE as required, any and all worn or questionable wiring, components, connections, connectors, warning labels, insulation and other items necessary for the continued safe operation of this product.

DO NOT TOUCH halogen lamps or nearby parts during or immediately after operation. WAIT AT LEAST TWENTY MINUTES (20 MIN.) BEFORE TOUCHING HALOGEN LAMPS. VERY HIGH TEMPERATURES will cause severe burns! Fractured or broken lamps may cause injury. To prevent cuts, REMOVE such lamps by HOLDING them with a cloth or wear work gloves. WEAR SAFETY GLASSES!

DO NOT LOOK DIRECTLY AT or TOUCH operating lamps!

*** QUALITY SERVICE ***

MODIFY your SERVICE Manual by notating changes and revisions of part numbers and procedures. Enter this information on the appropriate page...and include a copy of the notification in your Appendix "Product Updates".

READ AND UNDERSTAND customer comments and complaints on accompanying documentation (P.O. or other correspondence).
IF AN INJURY OR ILLNESS TO PATIENT OR USER, OR HAZARDOUS MALFUNCTION HAS OCCURRED OR IS SUSPECTED, DO NOT DISASSEMBLE, REASSEMBLE, ALTER OR REPAIR THE PRODUCT IN ANY WAY...INSTEAD, GIVE THE UNIT AND ALL ACCOMPANYING PAPERWORK TO YOUR REPAIR SUPERVISOR. Appropriate action per approved Welch Allyn policy will be taken.

When performing a complete inspection, LOOK for : missing parts, product defects, damage, tampering, unsafe condition of wiring or any component. ENTER all findings and test data along with repair status in the appropriate file.

Most of the repairs can be performed on a foam covered work bench. Place the LS100 in holding fixture for repairs. Take all actions to prevent scratching the bezel.

ALSO REFER TO:
ELECTRICAL SCHEMATIC, SERVICE PARTS DRAWING NOS.PN 440045 AND 440120.

Lamp does not illuminate.....		no voltage at A.C. source. CHECK measure and restore voltage.
	.....	lamp filament burned, "OPEN" circuit. Visually inspect filament. REPLACE open lamp.
	.....	defective switch, "OPEN" circuit CHECK voltage across switch in closed position. If voltage is 13.5 v.a.c. to 15.0 +/- 0.3 V.A.C., then switch s defective. REPLACE switch.
	.....	defective transformer, "OPEN" primary or secondary windings or defective or "failed OPEN" thermal protection device in transformer primary winding. CHECKcontinuity/ohms of transformer primary winding. REPLACE if 'open'. There is NO fuse or circuit breaker in the LS100. When the temperature of the transformer primary winding decreases to a pre-set value as determined by the manufacturer, the automatic thermal protection device will automatically restore to a closed or 'passing' condition.
	....	"OPEN" circuit in power cord or connecting wires and connectors. REPLACE defective component.
Lamp is not bright	....	Wrong lamp or supply voltage
	....	high resistance in wiring
	....	defective transformer
Lamp turns off after short time illuminated	....	transformer is operating at high temperature thus activating internal thermal protection device. REPLACE transformer.
	....	lamp is of too high wattage,(over 22 watts) and is overloading transformer. INSTALL correct lamp.
Lamp is intermittent when LS100 is touched or moved	....	loose connection in wiring or lamp is loose in lamp socket. RESTORE connections/REPLACE socket.

Switch produces arc or flash when operated	.... switch is defective or wiring connections are not secure.
Fails Dielectric strength	.... replace transformer/power cord assembly
Fails ground continuity testing	.... 1. remove the base mount plate and inspect the ground connection between the power cord ground pin and the base plate. Test for Continuity. 2. if step 1 above shows good connection, then the 'open circuit' is in the power cord. Replace entire transformer/power cord assembly.
Fails leakage current testing	....replace the entire transformer/power cord assembly.

LS100 WALL / TABLE MOUNT TROUBLESHOOTING

No light output	.... broken lamp (broken pins, filament, glass envelope,) REPLACE lamp.
	.... defective switch (failed open), replace switch. Note: there should be 14.0 Vac +/-.5 Vac the transformer output (no load). Lamp resistanceis about one ohm.
	.... no transformer output (defective transformer or transformer fuse.) REPLACE defective component.
	.... transformer output (secondary) ohms above 1.2 ohms..defective winding. REPLACE transformer.
	.... transformer input (primary) ohms above 25 ohms (75 ohms for export models), defective (open) primary or thermal fuse. REPLACE transformer.
	.... cable broken. INSPECT , REPLACE transformer.
Transformer is hot less	.... no load output of transformer is than 14.0 volts. Defective transformer. REPLACE transformer.

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CAUTION : DISCONNECT LS100 FROM A.C. POWER SOURCE
BEFORE SERVICING TO
AVOID ELECTRICAL SHOCK HAZARD

	Component:	Page:
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CAUTION: DISCONNECT LS100 FROM POWER SOURCE BEFORE SERVICING 8

A HALOGEN LAMP (R & R) PN06300

A **1. OPEN LIGHT CAP PN44024**
PRESS TWO TABS OR DETENTS ON OPPOSITE SIDES OF LIGHT CAP WHILE AT THE SAME TIME LIFTING LIGHT CAP. **PULL** OPEN TO EXPOSE LAMP AND LAMP SOCKET.

A 2. REMOVE HALOGEN LAMP PN06300
CAUTION: EXERCISE CAUTION SINCE LAMP QUARTZ ENVELOPE MAY BE: FRACTURED, CRACKED, OR HOT. **USE** A CLOTH TO HOLD THE OLD LAMP WHEN PULLING OLD LAMP OUT OF SOCKET. **DO NOT TWIST** LAMP...THIS WILL BREAK THE PINS FROM THE LAMP. **SUPPORT** LIGHT CAP WITH ONE HAND AND GENTLY **PULL** OLD LAMP STRAIGHT OUT WITH THE OTHER HAND. **REMOVE** BROKEN LAMP PARTS OR PINS FROM SOCKET WITH A LONG NOSE PLIERS.

A 3. REPLACE LAMP WITH NEW HALOGEN LAMP PN06300
DO NOT TOUCH NEW LAMP WITH YOUR FINGERS. FINGER GREASE OR OTHER CONTAMINANTS WILL DARKEN ON THE QUARTZ ENVELOPE AND CAUSE DISCOLORATION AND PREMATURE FAILURE OF THE REPLACEMENT LAMP. **CLEAN** LAMP BEFORE PLACING IN SOCKET. USE A TISSUE OR OTHER CLEAN CLOTH TO HOLD THE LAMP WITH WHILE INSERTING IT INTO THE SOCKET. **SUPPORT** LIGHT CAP WITH YOUR OPPOSITE HAND WHILE **INSERTING** LAMP STRAIGHT INTO LAMP SOCKET. **VERIFY** PROPER ALIGNMENT AND A SECURE CONNECTION BETWEEN LAMP AND LAMP SOCKET.

A 4. RESTORE LIGHT CAP TO ORIGINAL CLOSED POSITION
CLOSE THE LIGHT CAP AND **VERIFY** THAT BOTH TABS HAVE FULLY ENGAGED TO SECURE THE LIGHT CAP IN CLOSED POSITION. TEST BY TRYING TO OPEN LIGHT CAP WITHOUT DEPRESSING TABS. LIGHT CAP SHOULD NOT OPEN.

A 5. VERIFY REPAIR
CONNECT LS100 TO POWER SOURCE AND TURN LIGHT ON. ALLOW NEW LAMP TO **OPERATE** AT LEAST FIVE MINUTES TO 'BURN IN'.

T E C H N I C I A N N O T E S :

CAUTION: DISCONNECT LS100 FROM POWER SOURCE BEFORE SERVICING 9

B POWER SWITCH (R & R) PN440029

B 1. REMOVE SWITCH PN44029
APPLY A SMALL PIECE OF MASKING TAPE AT ONE END OF THE SWITCH TO PROTECT THE LIGHT HOUSING TOP FROM MARKING BY TOOLS DURING SWITCH REMOVAL. **PULL** SWITCH OUT OF THE LIGHT HOUSING PN440023-2 BY PRYING UPWARDS AT THE END OF THE SWITCH WITH A THIN EDGE SUCH AS A PUTTY KNIFE.

B 2. DISCONNECT WIRES FROM SWITCH
UNPLUG BOTH WIRES FROM THE BOTTOM OF THE SWITCH.

B 3. INSTALL NEW SWITCH
ATTACH WIRES AND **PRESS** SWITCH INTO LIGHT HOUSING, MAKING SURE THAT THE "0" LABEL ON THE TOP OF THE SWITCH IS TOWARDS THE GOOSENECK. SINCE THESE WIRES CARRY 12 VOLTS A.C., THE WIRES MAY BE ATTACHED TO THE SWITCH IN EITHER POSITION. **REFER** TO **WIRING DIAGRAM IN APPENDIX BB.**

B 4. VERIFY REPAIR
CONNECT LS100 TO POWER SOURCE AND OPERATE THE LAMP A NUMBER OF TIMES TO DETERMINE THAT THE SWITCH IS OPERATING PROPERLY.

CAUTION: DISCONNECT LS100 FROM POWER SOURCE BEFORE SERVICING

C TRANSFORMER/POWER CORD ASSEMBLY (R & R) PN----*
* part number for country of use, see parts list in catalog.

C 1. REMOVE BASE MOUNT PLATE PN440035-501
UNPLUG THE A.C. POWER CORD AND PLACE THE LS100 IN A HORIZONTAL POSITION. **UN-SCREW** FIVE (5) FASTENERS (1/4-20) PN106140-1 STARTING WITH THE CENTER FASTENER. IT IS SECURED WITH LOCKTITE 262-31 (RED PN M30328), AND WILL REQUIRE MORE TORQUE (OR HEAT FROM SOLDERING IRON APPLIED TO SCREW HEAD) TO UNFASTEN. THE CENTER SCREW IS THREADED INTO AN ALUMINUM INSERT IN THE BASE OF THE POLE. (NOT A SEPARATE PART NUMBER). **HOLD** THE POLE FIRMLY WITH ONE HAND WHILE LOOSENING THE CENTER SCREW WITH A VISE-GRIP LOCKING PLIERS (FOR PHILLIPS SCREWS USE A VISE GRIP..FOR MODELS THAT HAVE OTHER TYPES OF FASTENERS, USE APPROPRIATE TOOL). **SUPPORT** THE BASE PLATE WHEN IT SEPARATES FROM THE PLASTIC BASE. THIS WILL PROTECT THE WIRES AND CONNECTIONS FROM BEING PULLED BY THE WEIGHT OF THE TRANSFORMER AND METAL BASE PLATE. IF REPLACING BASE PLATE, TRANSFER MANUFACTURE DATE AND LABEL TO NEW BASE.

TRANSFORMER/POWER CORD ASSEMBLY (R & R) CONTINUED

CAUTION: IF JUST REMOVING THE POLE, AND THE TRANSFORMER WILL BE RE-USED, AS IN PROCEDURE 'K', **DO NOT CUT WIRES** UNTIL READING PROCEDURE 'K' STEP 2.

C 2. **DISCONNECT AND REMOVE OLD TRANSFORMER**
CUT THE SECONDARY WIRES AS CLOSE TO THE TRANSFORMER AS POSSIBLE. TRANSFORMER SECONDARY WIRES HAVE NO SPLICES. **DRILL OFF** TWO 1/8" POP RIVETS PN106125-1 TO SEPARATE TRANSFORMER COVER PN440037 (CONTAINING THE TRANSFORMER) FROM THE BASE PLATE. THE COVER WILL BE RE-USED. **UNSCREW** GROUNDING NUT FROM BASEPLATE GROUNDING STUD AND REMOVE GREEN WIRE. **DRILL** TWO 1/8" POP RIVETS PN106125-2 OFF TO SEPARATE TRANSFORMER FROM TRANSFORMER COVER.
* IF A NEW REPLACEMENT BASE PLATE IS TO BE INSTALLED, **TRANSFER** MANUFACTURE DATE AND WARNING STICKER TO THE NEW BASEPLATE AT THIS PART OF THE PROCEDURE.

C 3. **INSTALL REPLACEMENT TRANSFORMER**
VERIFY CORRECT VOLTAGE REQUIREMENT OF THE REPLACEMENT TRANSFORMER WITH REFERENCE TO THE PART NUMBER. **RIVET** REPLACEMENT TRANSFORMER TO COVER, AND COVER TO BASEPLATE.IF NECESSARY, **TRIM/CUT OFF** EXCESS TRANSFORMER SECONDARY WIRE TO REDUCE THE LENGTH OF UNNECESSARY WIRE WHICH WILL BE PUT BACK INTO BASE OF LS100. IF YOU CUT OFF TOO MUCH WIRE, THERE WILL BE INSUFFICIENT ROOM BETWEEN THE BASE AND THE BASEPLATE TO GET YOUR HANDS IN TO CRIMP ON THE CONNECTORS. **INSPECT** POLE BASE GROMMET PN440043-1 AND **REPLACE** IF CRACKED, WORN, OR MISSING. **ELECTRICALLY CONNECT AND RESTORE** WIRING BETWEEN TRANSFORMER SECONDARY AND LAMP WIRING FROM THE POLE. **REFER** TO **WIRING DIAGRAM IN APPENDIX BB.** CONNECT EACH TRANSFORMER SECONDARY WIRE TO THE CORRESPONDING LAMP SUPPLY WIRE AS IN **WIRING DIAGRAM.** **DO NOT MAKE** A DIRECT CONNECTION (SHORT CIRCUIT) BETWEEN THE TWO TRANSFORMER SECONDARY WIRES. **USE** CLOSED END 'CRIMP' CONNECTORS PN711036. **STRIP, CRIMP, AND INSPECT** TO **VERIFY** NO EXPOSED CONDUCTORS. **RESTORE** GROUND CONNECTION TO BASEPLATE WELDED STUD WITH EXTERNAL TOOTH # 6 LOCKWASHER PN745147. **DO NOT OMIT LOCKWASHER.**
IF NEW BASEPLATE IS USED, **TRANSFER** THE ORIGINAL DATE OF MANUFACTURE TO THE NEW REPLACEMENT PART. (USE MARKING PEN OR DATE STAMPER). IF APPLICABLE, **TRANSFER** ANY REPAIR RELATED NOTES THAT WERE WRITTEN ON THE INSIDE OF THE BASE PLATE, SUCH AS A REPAIR TRACKING NUMBER.

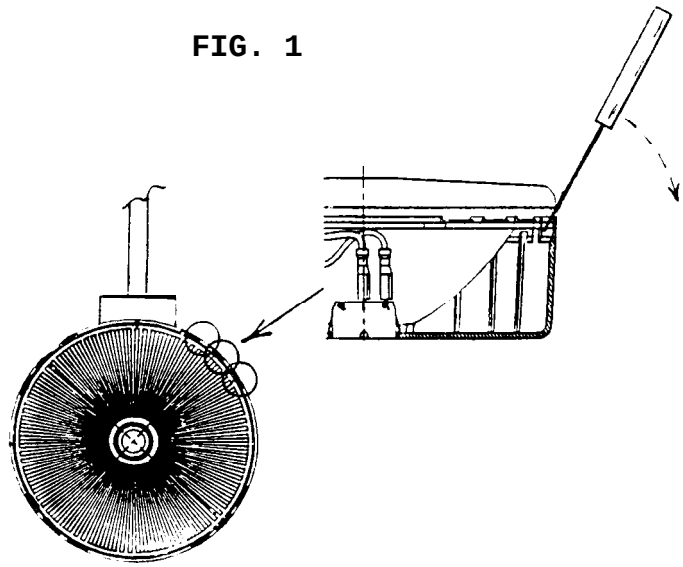
C 4. ATTACH BASE PLATE TO WEIGHTED BASE.
PLACE A.C. POWER CORD IN THE 'S' GROOVE (STRAIN RELIEF) OF THE WEIGHTED BASE. **ATTACH** BASE PLATE WITH FOUR OUTER FASTENERS FIRST. BEFORE TIGHTENING OUTER 4 FASTENERS, **RE-CHECK** THAT A.C. POWER CORD IS STILL IN 'S' GROOVE. **APPLY** LOCKTITE #262-31 PN M30328, TO CENTER FASTENER. **INSPECT** THAT NO WIRES WILL BE TRAPPED BETWEEN POLE BOTTOM AND BASE PLATE. **INSERT AND TORQUE** CENTER FASTENER TO 37 INCH/LBS +/- 2 INCH/LBS.

C 5. VERIFY REPAIR
CONNECT LS100 TO APPROPRIATE A.C. POWER OUTLET AND ILLUMINATE LAMP FOR APPROXIMATELY 15 MINUTES. **OBSERVE** FOR ILLUMINATION, NO EXCESSIVE HEAT OR A.C. CYCLE SOUND OR 'HUM' FROM TRANSFORMER. **PERFORM** APPROPRIATE TEST, A02476 TEST, OR A02477 TEST.

D BEZEL (R & R) PN440021

D 1. PRY BEZEL *
SEE FIGURE 1. HOLD THE LIGHT HOUSING ASSEMBLY SO THAT THE BEZEL IS FACING UP, AND THE GOOSENECK IS AT THE TOP. WITH ONE HAND HOLDING THE LIGHT HOUSING, **PRY** THE BEZEL OFF WITH A THIN FLAT-BLADE SCREWDRIVER TIP IN A GAP SHOWN AT CIRCLE IN FIG.1. **SEPARATE** BEZEL FROM LIGHT HOUSING WITH FINGERS WHILE **CAREFULLY PRYING** WITH SCREWDRIVER AT ALTERNATE LOCATIONS SHOWN BY CIRCLES IN FIG. 1. THIS CAN BE DONE GENTLY AND WITH NO MARRING OR DAMAGE TO EITHER THE BEZEL OR LIGHT HOUSING.
***** THERE ARE FOUR SETS OF 3 RETAINING DETENTS MOLDED INTO THE BEZEL WHICH HOLD IT INTO THE LIGHT HOUSING. THEY ARE 90 DEGREES APART AND CAN BE DEFEATED BY CAREFUL PRYING. **DO NOT**: BREAK OFF DETENTS, HOUSING.

FIG. 1



D 2. REMOVE BEZEL
WHEN ALL FOUR LOCATIONS OF BEZEL RETAINING TABS ARE DISENGAGED FROM THE LIGHT HOUSING, REMOVE BEZEL.

D 3. REPLACE BEZEL
INSPECT LAMP, REFLECTOR, AND THE BEZEL FOR ANY DIRT, DUST, AND OR FINGERPRINTS. CLEAN PER INSTRUCTIONS IN OWNER'S GUIDE BEFORE RE-ASSEMBLY. PUT BEZEL OVER LIGHT HOUSING AS SHOWN IN FIG. 2a BELOW. NOTE THAT THE DETENT TABS ON THE BEZEL ARE IN AN UP/DOWN/LEFT/RIGHT ORIENTATION. BY STARTING OUT THIS WAY, THE WELCH ALLYN LABEL WILL BE 'RIGHT-SIDE-UP' AS SHOWN, AFTER THE BEZEL IS ROTATED 45 DEGREES COUNTER-CLOCKWISE AND LOCKED IN PLACE. SEE FIG. 2b BELOW.

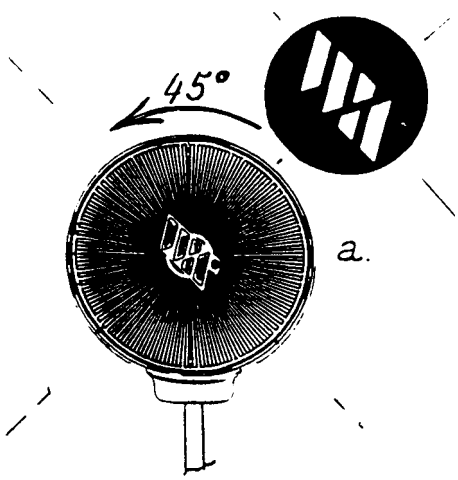


FIG. 2 a

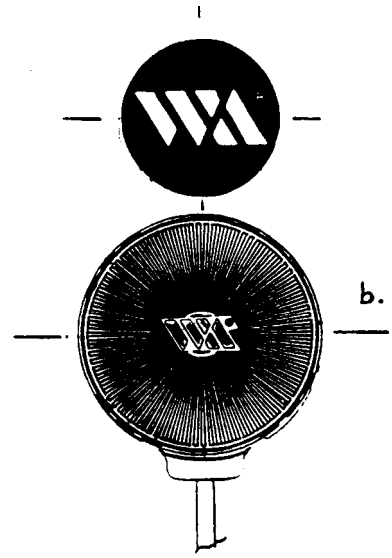


FIG. 2 b

D 3. CONTINUED
PRESS GENTLY AND EVENLY TO INTERLOCK THE BEZEL TO THE LIGHT HOUSING. SEE FIG. 2 b.
ROTATE BEZEL COUNTER-CLOCKWISE APPROXIMATELY 45 DEGREES. THREE CLICKS WILL BE HEARD AS EACH OF THE THREE SETS OF DETENTS LOCKS IN PLACE. THE WELCH ALLYN LOGO SHOULD APPEAR AS SHOWN IN FIG. 2 b.

E REFLECTZR (R & R) PN440005

E 1. REMOVE HALOGEN LAMP, BEZEL.
PRIOR PROCEDURES: Al & A2 / D1 & D2

E 2. REMOVE REFLECTOR
SEE FIG. 3. HOLD THE LIGHT HOUSING ASSEMBLY SO THAT THE REFLECTOR IS FACING UP AND THE GOOSENECK IS AT THE TOP AS SHOWN IN FIG. 3. WITH ONE HAND ON THE LIGHT HOUSING, PLACE A THIN FLAT-BLADE SCREWDRIVER TIP IN A GAP AT THE UPPER RIGHT POSITION (SHOWN IN FIG. 3 AT CIRCLE) BETWEEN THE OUTER PERIMETER OF THE REFLECTOR AND THE INSIDE SURFACE OF THE LIGHT HOUSING. PRY REFLECTOR DETENTS OUT OF ENGAGEMENT TO ENABLE YOU TO PUT YOUR FINGERS UNDER THE REFLECTOR FLANGE AT THE TOP. NOW INSERT THE SCREWDRIVER AT THE LOWER RIGHT, AND DISENGAGE DETENTS THERE BY PRYING AS BEFORE. PULL UP WITH YOUR FINGERS TO DISENGAGE AND REMOVE REFLECTOR. DO NOT MAR REFLECTOR OR LIGHT HOUSING WITH SCREWDRIVER. DO NOT SMUDGE OR SCRATCH MIRRORED SURFACE OF REFLECTOR.

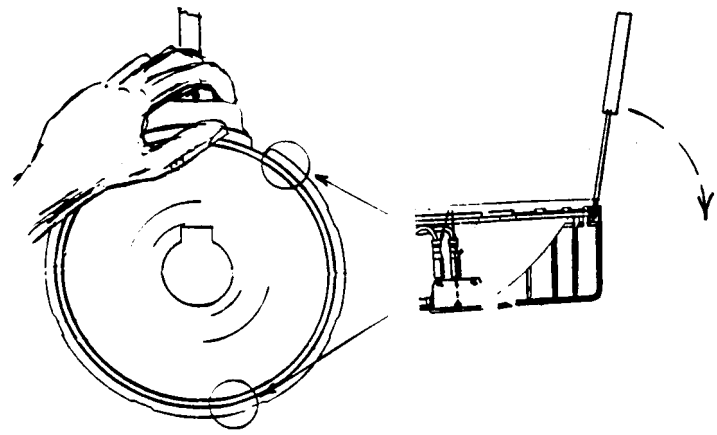


FIG. 3

E 3. REPLACE REFLECTOR
VERIFY THAT ALL WIRES ARE ON THE SWITCH SIDE OF THE LIGHT HOUSING AND WILL NOT BE PINCHED OR CUT WHEN REFLECTOR IS PRESSED INTO PLACE. **ALIGN** REFLECTOR TO ITS ORIGINAL POSITION AND **PRESS** IT FIRMLY AND EVENLY INTO THE LIGHT HEAD. **CONFIRM** THAT IT IS FULLY ENGAGED AROUND ENTIRE CIRCUMFERENCE. **CLEAN** REFLECTOR MIRRORED SURFACE PER INSTRUCTIONS IN OWNER'S GUIDE.

F LIGHT CAP PN440024 (R & R)

F 1. OPEN LIGHT CAP.
PRESS DETENTS ON OPPOSITE SIDES OF LIGHT CAP AND **LIFT** CAP UP.

F 2. SEPARATE LIGHT CAP FROM HINGE STANDOFF
REMOVE TWO SCREWS PN106124-4 AND PRESS DETENTS TO SEPARATE THE LIGHT CAP FROM THE HINGE STANDOFF.

F 3. REPLACE LIGHT CAP
ALIGN HINGE STANDOFF OVER LIGHT CAP SO IT DOES NOT OBSCURE MOLDED IN PRINTED **CAUTION** STATEMENT ON UNDERSIDE OF LIGHT CAP. **REASSEMBLE** IN REVERSE ORDER OF DISASSEMBLY.

F 4. VERIFY REPAIR
INSPECT WIRING TO DETERMINE THAT NO WIRES ARE PINCHED OR DAMAGED AND THAT LIGHT CAP CLOSES WITHOUT DIFFICULTY.

G HINGE STANDOFF (R & R) PN440022-1

G 1. REMOVE LAMP

G 2. REMOVE BEZEL

G 3. REMOVE REFLECTOR

G 4. REMOVE LIGHT CAP

G 5. DISCONNECT WIRES
DISCONNECT BOTH WHITE LAMP SOCKET WIRES FROM: a)SWITCH, b)SECONDARY WIRE.

G 6. REMOVE HINGE STANDOFF/LAMP SOCKET ASSEMBLY FROM LAMP HOUSING PN440023-2
ROTATE HINGE STANDOFF ASSEMBLY 90 DEGREES AND LIFT UP AND OUT OF LIGHT HOUSING.

G 7. REMOVE LAMP SOCKET FROM HINGE STANDOFF
UNSCREW TWO LAMP SOCKET RETAINING SCREWS PN106124-5, AND MANIPULATE SOCKET WIRES TOWARDS SOCKET TO EXPOSE THEM FOR CUTTING. **CUT** WIRES AND REMOVE AND DISCARD SOCKET AND SOCKET WIRE.

G 8. REPLACE HINGE STANDOFF
INSTALL REPLACEMENT LAMP SOCKET PN440027 BY ROUTING WIRING THROUGH HINGE STANDOFF AS PER THE ORIGINAL.
ATTACH NEW CRIMP CONNECTORS (PN106134-1 AND PN483308) TO SOCKET WIRES. REASSEMBLE IN REVERSE ORDER OF DISASSEMBLY.
REFER TO WIRING DIAGRAM IN APPENDIX BB.

H LAMP SOCKET PN440027 (R & R)

SEE 'HINGE STANDOFF (R & R)'

I LIGHT HOUSING PN440023-2 (R & R)

I 1. REMOVE LAMP

I 2. REMOVE BEZEL

I 3. REMOVE REFLECTOR

I 4. DISCONNECT ALL WIRE CONNECTIONS
REMOVE WIRES FROM SWITCH, AND POLE WIRES TO SOCKET. **DO NOT CUT** OFF CONNECTORS.

I 5. REMOVE LIGHT CAP

I 6. REMOVE SWITCH

I 7. REMOVE HINGE STANDOFF

I 8. SEPARATE LIGHT HOUSING FROM GOOSENECK
UN-TIE WIRE KNOT. **UNSCREW** SOCKET-HEAD CAP SCREW (4-40 X.125") PN106119-3 USING A 3/32" HEX KEY TOOL. THIS SCREW PROVIDES ROTATION-STOP AND RETAINING FUNCTION AND IS FOUND AT THE END OF THE GOOSENECK WITHIN THE LIGHT HOUSING. **PULL** THE GOOSENECK OUT OF THE LIGHT HOUSING. **UNSCREW** THE WHITE TIGHTENING COLLAR PN440068-1 AND REMOVE THE ROTATIONAL-STOP HEAD PN440069-1.

I 9. REPLACE LIGHT HOUSING.
REASSEMBLE IN REVERSE ORDER OF DISASSEMBLY. THE ROTATIONAL-STOP HEAD SHAFT IS FLAT ON ONE SIDE AS IS THE HOLE IN THE LIGHT HOUSING. LOCKTITE 262-21 (PN M30328) IS USED ON SOCKET-HEAD CAP SCREWS (4-40 X .125) PN106119-3. MOLYCOAT 33 GREASE (PN M11041) IS USED ON THE 'O' RINGS OF THE ROTATION STOP HEAD AT THE TOP OF THE GOOSENECK. **REFER** TO **WIRING DIAGRAM IN APPENDIX BB.**

I 10. VERIFY REPAIR
CONNECT LS100 TO POWER SOURCE AND TURN ON. **TEST** FOR ROTATION AND ROTATION-STOP WITH NO SQUEAKING.

J GOOSENECK ASSEMBLY PN440007-503 (R & R)

J 1. **REMOVE** LIGHT HOUSING
PRIOR PROCEDURE 'I'

J 2. **REMOVE GOOSENECK FROM POLE**
CUT OFF TWO CONNECTORS PN483308 RIGHT AT THE CONNECTORS O FACILITATE REMOVAL OF THE GOOSENECK OVER THE WIRES. **PRY** TWO PRONGS LOCATED AT UPPER END OF THE POLE OUTWARD ONLY ENOUGH TO DISENGAGE INSERT SLEEVE PN440065 TO ELEASE GOOSENECK. THIS WILL USUALLY REQUIRE ONLY SLIGHT BENDING SO THEY ARE FLUSH OR EVEN WITH THE POLE OUTSIDE DIAMETER. USE A SMALL FLAT-BLADE SCREWDRIVER FOR THIS. **LIFT** GOOSENECK FROM POLE WHILE PULLING SECONDARY WIRES OUT OF GOOSENECK.

J 3. **REMOVE SLEEVE INSERT PN440065**
UNSCREW FASTENER PN106119-3 FROM THE LOWER END OF THE GOOSENECK CONNECTOR AND **PULL** THE SLEEVE INSERT OFF.

J 4. **REASSEMBLE GOOSENECK ASSEMBLY (DO NOT CONNECT GOOSENECK TO POLE IF LS100 WILL BE PACKED FOR SHIPPING)**
REPLACE O-RINGS PN106108-7 AND PN482038 ON GOOSENECK AND SLEEVE INSERT. TO MAKE IT EASIER TO **FEED** THE LAMP IRES THROUGH THE REPLACEMENT GOOSENECK, **STRAIGHTEN** THE GOOSENECK AND **INSERT** A LENGTH OF COAT-HANGER WIRE OR OTHER SMALL DIAMETER WIRE THROUGH THE GOOSENECK SO THAT IT EXTENDS BEYOND BOTH ENDS. **ATTACH** THE LAMP WIRES TO THIS STIFF WIRE AND **PULL** THE LAMP WIRES THROUGH THE OOSENECK. (IN CIRCUMSTANCES WHERE ONLY THE WIRES MUST BE REPLACED, SIMPLY ATTACH A LONG STRING TO THE LAMP WIRES BEFORE PULLING OUT THE OLD WIRES. LEAVE THE STRING HANGING OUT BOTH ENDS. TIE ON THE REPLACEMENT WIRES IE: NEW TRANSFORMER SECONDARY WIRES, AND USE THE STRING TO PULL THEM THROUGH THE POLE AND GOOSENECK ASSEMBLY.) **ASSEMBLE** IN REVERSE ORDER OF DISASSEMBLY. **USE** LOCKTITE 262-21 (PN M30328) ON SOCKET-HEAD CAP SCREW **APPLY** DOW 111 (PN M11379) GREASE ON LOWER GOOSENECK ROTATION STOP (NOT MOLYCOAT 33 AS USED ON UPPER GOOSENECK ROTATION STOP). THE DOW 111 THAT YOU WILL USE ON THE LOWER ROTATION STOP ASSEMBLY WILL PROVIDE SLIGHTLY MORE RESISTANCE TO ROTATION THAN THE MOLYCOAT 33 REQUIRED.THIS GREATER RESISTANCE IS DESIRABLE.

J 4. CONTINUED

INSPECT THAT THERE IS A WIRE PROTECTOR PN440059 AROUND THE WIRES AT THE TOP OF THE POLE. **REFER** TO SET-UP INSTRUCTION IN OWNERS MANUAL. **BEND** TWO PRONGS LOCATED AT THE UPPER END OF THE POLE INWARD APPROXIMATELY 10 DEGREES TO ENABLE THEM TO RETAIN GOOSENECK WHEN INSERTED INTO THE POLE. **ALIGN** THE TWO FLAT RECESSED AREAS OF THE INSERT WITH THE PRONGS OF THE POLE AND **INSERT** SECURELY. **INSERT** WIRES UP AND THROUGH GOOSENECK ASSEMBLY AND **ATTACH** NEW CRIMP CONNECTORS PN483308. **REFER** TO **WIRING DIAGRAM IN APPENDIX BB.**

J 5. VERIFY REPAIR
ILLUMINATE LS100. FLEX GOOSENECK. **CHECK** FOR ROTATION STOP WITH NO SQUEAKING SOUND AND SMOOTH OPERATION.

K BASE POLE PN440033 (R & R)

K 1. REMOVE BASE MOUNT PLATE ASSEMBLY
PRIOR PROCEDURE 'C' STEP 1.

K 2. CUT TRANSFORMER SECONDARY WIRES
CUT BOTH TRANSFORMER SECONDARY WIRES MIDWAY BETWEEN THE POLE GROMMET AND THE TRANSFORMER COVER GROMMET. THIS WILL PROVIDE ENOUGH LENGTH TO ADEQUATELY STRIP, AND REATTACH POLE WIRES TO TRANSFORMER. CUTTING THEM TOO CLOSE TO THE TRANSFORMER WILL RENDER THE TRANSFORMER USELESS. CUTTING THEM TOO CLOSE TO THE POLE GROMMET WILL NECESSITATE REMOVING LIGHT HOUSING AND FEEDING MORE WIRE TO THE BASE. THIS REQUIRES UNTYING THE KNOT AT THE LIGHT HOUSING, FEEDING MORE WIRE DOWN THE POLE, AND RE-TYING THE KNOT.

K 3. REMOVE GOOSENECK FROM POLE
PRIOR PROCEDURE 'J' STEPS 1 & 2

K **4.** **REMOVE** POLE FROM BASE.
TRANSFER THE LARGE 'O' RING AT THE BOTTOM OF THE POLE TO THE REPLACEMENT POLE. THE FUNCTION OF THIS IS TO CONCEAL THE CONNECTION BETWEEN THE POLE AND THE BASE.

K **5.** **REMOVE** GROMMET FROM POLE.
SAVE GROMMET FOR REASSEMBLY IF IT IS IN GOOD CONDITION.

K **6.** **REASSEMBLE (DO NOT CONNECT GOOSENECK TO POLE IF THE LS100 MUST BE PACKED FOR SHIPPING BACK TO THE CUSTOMER)**
PUT GROMMET OVER SECONDARY WIRES AND INSERT IT INTO THE WIRE HOLE IN THE POLE. DO THIS BEFORE CONNECTING THEM TO THE TRANSFORMER. **ELECTRICALLY CONNECT AND RESTORE** THE TRANSFORMER SECONDARY WIRES TO THE LAMP WIRING FROM THE POLE USING CLOSED END CRIMP CONNECTORS PN711036. **DO NOT MAKE** A DIRECT CONNECTION (SHORT CIRCUIT) BETWEEN THE TWO TRANSFORMER SECONDARY WIRES. **REFER** TO **WIRING DIAGRAM IN APPENDIX BB. STRIP, CRIMP,** TO MAKE TIGHT CONNECTIONS WITH NO EXPOSED CONDUCTORS.

K **7.** **VERIFY REPAIR**
CONNECT LS100 TO APPROPRIATE A.C. POWER OUTLET AND ILLUMINATE LAMP. **CHECK** FOR QUIET AND SMOOTH OPERATION AS IN PREVIOUS STEP. CHECK ROTATION STOP. **PERFORM** APPROPRIATE TEST, A02476 OR A02477.

T E C H N I C I A N N O T E S:

CAUTION: DISCONNECT LS100 FROM POWER SOURCE BEFORE SERVICING.

L TRANSFORMER/POWER CORD ASSEMBLY/FUSES (R & R)
for <u>WALL AND TABLE MOUNT LS100 MODEL 44110</u>.

L 1. REMOVE TRANSFORMER CORD FROM LAMP.
DETERMINE IF FUSE(S) HAVE BECOME OPEN OR IF TRANSFORMER WINDINGS FAILED OR BOTH.
HOLD THE WALL BRACKET FIRMLY WITH ONE HAND WHILE REMOVING THE CORD STRAIN RELIEF. **USE** STRAIN RELIEF PLIERS OR **CUT** STRAIN RELIEF OFF WITH DIAGONAL CUTTERS.

L 2. DISCONNECT TRANSFORMER WIRES IN LIGHT HEAD.
FOLLOW INSTRUCTIONS IN SECTION D TO **REMOVE** BEZEL. **FOLLOW** INSTRUCTIONS IN SECTION E TO **REMOVE** REFLECTOR. **DISCONNECT** THE TWO CONNECTORS THAT CONNECT THE LAMP SOCKET WIRING TO THE WIRES COMING UP THE GOOSENECK. **CUT** OFF THE OLD CONNECTORS ON THE WIRE COMING UP THE GOOSENECK. **UNTIE** KNOT, AND **PULL** THE TRANSFORMER WIRES OUT FROM THE WALL BRACKET.

L 3. INSTALL REPLACEMENT TRANSFORMER
VERIFY CORRECT VOLTAGE REQUIREMENT OF THE REPLACEMENT TRANSFORMER WITH REFERENCE TO THE PART NUMBER AND COUNTRY OF DESTINATION. **TRIM** TRANSFORMER SECONDARY WIRE TO THE SAME LENGTH AS THE ORIGINAL ONE JUST REMOVED. **REMOVE** OUTER WIRE INSULATION CABLE STRIPPER TOOL (SEE TOOL LIST). **INSERT** REPLACEMENT TRANSFORMER WIRE INTO LAMP GOOSENECK. **REMOVE** INSULATION FROM END OF WIRE AND **CRIMP ON** NEW CONNECTORS. **TIE** AN OVERHAND KNOT WHERE WIRES ENTER THE LIGHT HEAD. **CONNECT** THE BLACK WIRE FROM THE TRANSFORMER SECONDARY TO THE LAMP SOCKET WIRE. **CONNECT** THE WHITE WIRE FROM THE TRANSFORMER SECONDARY TO THE SWITCH. **NEVER CONNECT BOTH WIRES FROM** SHORT CIRCUIT). **USE** CLOSED END 'CRIMP' CONNECTORS PN711036. **STRIP, CRIMP, AND INSPECT** FOR BARE WIRE CONDUCTORS. **INSTALL** NEW STRAIN RELIEF. **RE-ASSEMBLE** LIGHT HEAD AND **TEST** LS100 TO "A" SPECS IN APPENDIX.

L 4. REPLACE TRANSFORMER FUSE. THE DOMESTIC (U.S.A.) TRANSFORMER MODEL #_____ HAS A REPLACEABLE 5 AMP FUSE SOLDERED IN SERIES WITH THE SECONDARY WINDING AT THE TERMINALS.THE INTERNATIONAL TRANSFORMER MODEL#_____HAS BOTH A REPLACEABLE 5 AMP FUSE SOLDERED IN SERIES WIHT THE SECONDARY WINDING **AND** A REPLACEABLE 200 MILLIAMP FUSE SOLDERED IN SERIES WITH THE PRIMARY TRANSFORMER WINDING. **UNSOLDER** FUSE. **REMOVE** THE PLASTIC COVER OF THE FUSE AND PUT IT ONTO THE REPLACEMENT FUSE BEFORE SOLDERING IT TO THE TRANSFORMER. **REPLACE** WITH APPROPRIATE REPLACEMENT FUSE FOR THE COUNTRY OF USE.

L 5. VERIFY REPAIR
CONNECT LS100 TO APPROPRIATE A.C. POWER OUTLET AND ILLUMINATE LAMP. **PERFORM** APPROPRIATE 'A' TESTS.

CAUTION: DISCONNECT LS100 FROM POWER SOURCE BEFORE SERVICING. BEFORE REPLACING TRANSFORMER, REFER TO THE TROUBLESHOOTING SECTION TO DETERMINE IF THE FUSE(S) HAVE BECOME OPEN OR IF THE TRANSFORMER WINDINGS HAVE FAILED.

M WALL / TABLE MOUNT GOOSENECK ASSEMBLY PN440007-503 R & R.

M 1. REMOVE LIGHT HOUSING.
FOLLOW PROCEDURE 'I' IN MAIN PART OF THIS MANUAL.

M 2. REMOVE GOOSENECK FROM WALL BRACKET.
CUT OFF TWO CONNECTORS PN483308 RIGHT AT THE CONNECTORS TO FACILITATE REMOVAL OF THE GOOSENECK OVER THE WIRES. **REMOVE** SET SCREW (**USE** 3/32" HEX KEY) TO DISENGAGE INSERT SLEEVE PN440065 TO RELEASE GOOSENECK FROM WALL BRACKET. (IF THE TABLE BRACKET IS ATTACHED, **REMOVE** IT TO GAIN ACCESS TO THIS SET SCREW.) **DO NOT REMOVE** STRAIN RELIEF OR WIRE FROM WALL BRACKET. **PULL** WIRE OUT OF GOOSENECK.

M 3. REMOVE SLEEVE INSERT PN440065
UNSCREW FASTENER PN106119-3 FROM THE LOWER END OF THE GOOSENECK CONNECTOR AND **PULL** THE SLEEVE INSERT OFF.

M 4. REASSEMBLE GOOSENECK ASSEMBLY.
REPLACE O-RINGS PN106108-7 AND PN482038 ON GOOSENECK AND SLEEVE INSERT. **APPLY** DOW 111 (PN M11379) GREASE ON LOWER GOOSENECK ROTATION STOP (NOT MOLYCOAT 33 AS USED ON UPPER GOOSENECK ROTATION STOP). THE DOW 111 THAT YOU WILL USE ON THE LOWER ROTATION STOP ASSEMBLY WILL PROVIDE SLIGHTLY MORE RESISTANCE TO ROTATION THAN THE MOLYCOAT 33 REQUIRED. THIS GREATER RESISTANCE IS DESIRABLE.**INSERT** TRANSFORMER WIRES INTO NEW GOOSENECK. **INSERT** GOOSENECK INTO WALL BRACKET AND **SECURE** WITH SET SCREW AND LOCKTITE. **MAKE SURE** THE ROTATIONAL STOP OF THE SLEEVE INSERT IS FACING THE 'WALL' SIDE OF THE WALL BRACKET. **TIGHTEN** SET SCREW TO **2.0 +/-.5 IN/LBS.**

M 5. RE-CONNECT TRANSFORMER WIRES.
REMOVE INSULATION FROM ENDS OF WIRES AND **CRIMP ON** NEW ONNECTORS. **CONNECT** EACH TRANSFORMER SECONDARY WIRE TO THE CORRESPONDING LAMP SUPPLY WIRE. **DO NOT MAKE** A DIRECT CONNECTION (SHORT CIRCUIT) BETWEEN THE TWO TRANSFORMER SECONDARY WIRES. **USE** CLOSED END 'CRIMP' CONNECTORS PN711036. **STRIP, CRIMP, AND INSPECT** TO **VERIFY** NO EXPOSED CONDUCTORS. **PLUG** NEW CONNECTORS TO LAMP WIRING. **RE-ASSEMBLE** LIGHT HEAD.

M **5.** **VERIFY REPAIR.** 22

ILLUMINATE LS100. **BEND** GOOSENECK. **CHECK** FOR ROTATION STOP WITH NO CONTINUAL SQUEAKING SOUND AND SMOOTH OPERATION.

N TABLE BRACKET ASSEMBLY.

N **1.** **REMOVE THREADED ROD AND KNOB.**

GENTLY PULL THE SWIVEL PAD UPWARDS AND **TURN** THE HREADED ROD CLOCKWISE TO **UNSCREW** THE PAD FROM ITS LEFT HANDED (REVERSE) THREADS. **UNSCREW** THE THREADED ROD FROM THE BRACKET.

N **2.** **INSTALL KNOB ON THREADED KNOB.**

PLACE LOCKTITE ON LAST 5 THREADS OPPOSITE THE SWIVEL END.

THREAD THE KNOB ONTO THE ROD AS FAR AS IT WILL GO. **WIPE** OFF EXCESS LOCKTITE. **SECURE** THE KNOB ONTO THE ROD WITH THE SET SCREW. **TIGHTEN** SET SCREW TO 19 TO 21 IN/LBS. **USE** 3/32" HEX KEY.

N **3.** **ATTACH SWIVEL PAD TO ROD.**

THREAD THE THREADED ROD WITH KNOB INTO THE BRACKET. **THREAD** THE SWIVEL PAD ONTO THE THREADED ROD (LEFT HANDED THREAD).

T E C H N I C I A N N O T E S:

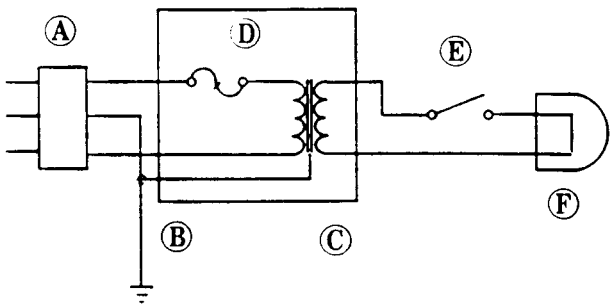
APPENDIX AA
EXPLODED VIEW OF LS100 WITH PARTS LEGEND
DRAWING # 440045, 440120

APPENDIX BB

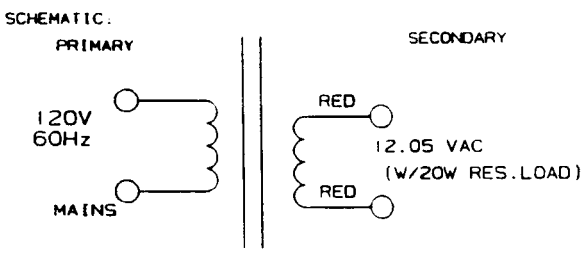
WIRING DIAGRAM/SCHEMATIC LS100

SYSTEM SCHEMATIC

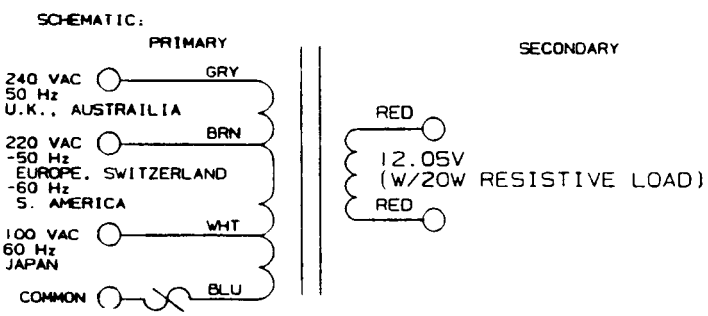
A Plug
B Step Down Transformer
C Transformer Cover
D Thermal Cut-Out
Automatic Reset
E On-Off Switch
F Lamp



DOMESTIC TRANSFORMER



INTERNATIONAL TRANSFORMER



APPENDIX CC
REPAIR VERIFICATION TEST PROCEDURES

Perform the following test procedures after repairs have been made and prior to returning the LS100 to the customer.

1. PERFORM THE FOLLOWING WELCH ALLYN TESTS. COPIES OF TESTS ARE INCLUDED IN THIS APPENDIX.

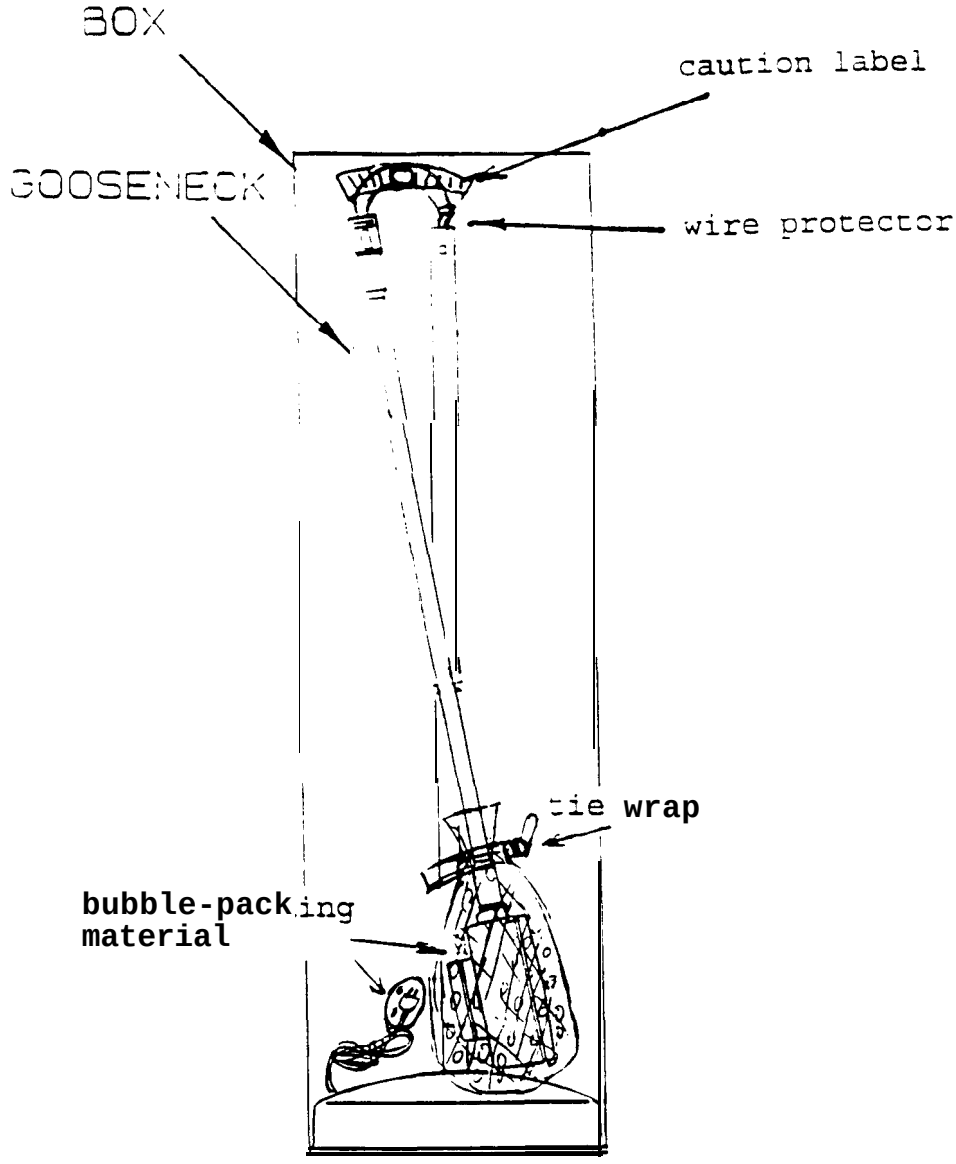
Domestic -- A 02477
Export -- A 02476

Domestic and International equivalents for terminology used in tests appear below. If there any questions or uncertainties regarding test specifications, procedures, or necessary equipment, do not hesitate to contact Welch Allyn.

Int./IEC Nomenclature	**U.S./NFPA UL544 Nomenclature**
L1	Hot
L2	Neutral
Earth	Ground
Mains	Line Voltage
Applied Parts	Patient Leads
Enclosure Case	Chassis
Protective Earth	Ground Wire
Enclosure Leakage	Lead Leakage
Patient Auxiliary	Leakage between Patient Leads
Mains on Applied Parts	Lead isolation
Insulation Resistance	Dielectric Strength or Insulation Resistance between Hot & Neutral to Ground
Earth Continuity	Grounding Continuity

APPENDIX DD
PACKAGING FOR SHIPMENT

REPACK AS SHOWN:



APPENDIX EE
SAFETY / ADVISORY LABELS

Part No.:	Description:
440030-1	Label, Bezel
440056-1	Label, Brazil
747041	Warning Tag
440061	Cap Trim Label
440087	Lamp Insertion Label
440041-3	Label, Halogen, Domestic
747042-2	Service Label
440050-1	Label, Europe
440052-1	Label, United Kingdom
440054-1	Label, Australia

APPENDIX EE CONTINUED

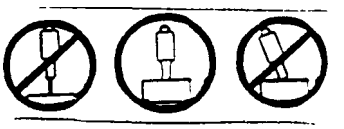
SERVICE LABEL (POLE BASE)

Welch Allyn 2068 UL LISTED E15508
SKANEATELES FALLS. N.Y.
13153 U.S.A
INPUT . 24A/120V~60Hz
OUTPUT I .7A/12V
STANDARD NORME
C22.2 NO.125
RISK CLASS 2G
CATEGORIE DE RISQUE LR16391
MODEL 44100
LS 100 HALOGEN LIGHT
DANGER
RISK OF EXPLOSION
IF USED IN THE
PRESENCE OF
FLAMMABLE ANESTHETICS
DANGER
RISQUE D'EXPLOSION
NE PAS EMPLOYER
EN PRESENCE
D'ANESTHESIQUES
INFLAMMABLES

CAUTION LABEL (BASE PLATE)

CAUTION ⚠
ELECTRIC SHOCK HAZARD, 00 NOT DISASSEMBLE INSTRUMENT REFER SERVICING TO OUALIFIED SERVICE PERSONNEL.

LAMP INSERTION LABEL
(UNDER LIGHT CAP)



PACKING CAUTION LABEL
(PLACED ON WIRES WHEN SHIPPED SEE APPENDIX EE)

CAUTION!
HOLD BOTH FLEXIBLE ARM AND POLE. THEN LIFT FROM BOX

ATTENTION :
TENIR ENSEMBLE LE BRAS FLEXIBLE ET LA COLDNNE DE SUPPORT, **PUIS SOULEVER** DE LA **BOITE**

ACHTUNG!
DEN FLEXIBLEN ARM UND OAS **STATIV GLEICHZEITIG AUS** DEM KARTON **HEBEN.**

¡PRECAUCION!
SUJETAR JUNTOS EL BRAZD FLEXIBLE Y EL POSTE AL SACARLOS DE LA CAJA

747041

GROUNDING RELIABILITY IS ONLY ASSURED WHEN THIS CORD IS CONNECTED TO RECEPTACLE MARKED "HOSPITAL GRADE."

WARNING TAG (ON LINE CORD)

APPENDIX FF

The following items or their equivalent are required for the complete repair and testing of the LS100 Halogen Light:

COMMON TOOLS:

Item:	Description:	Catalog #:
1.	Screwdriver: Phillips #1*	cat. #2501
2.	Screwdriver: Phillips #2*	cat. #2502
3.	Spanner Insert: Magna #41780 ****	cat. #41780
4.	Replaceable bit driver:APEX M-1505****	cat. #M1505
5.	Screwdriver: 7/32" 5.5mm Flat Blade*	cat. #143-3
6.	Pliers, locking: Vise-Grip 7"curved **	cat. #7WR
7.	Pliers, long nose: Xcelite 51CG *	cat. #51CG
8.	Pliers, crimping: Klein 1005 **	cat. #1005
9.	Wire cutter: Xcelite 107CG *	cat. #107CG
10.	Wire stripper: Xcelite 105SCG *	cat. #105SCG
11.	3/32" hex key (Allen Wrench)** set	cat. #BLX12
12.	Drill bit set:13 piece **	cat. #10245
13.	3/8 "electric drill:Skill 3/8"VSR **	cat. #622514.
	Hand riveter:Pop-Rivet prg-402HC****	cat. #PRG402HC
15.	Volt-Ohm Meter (with input impedance above 1 megohm) BECKMAN 330***	cat. #330
16.	Alligator test leads kit***	cat. #TL246A
17.	Soldering iron:80W Ungar 3180 ***	cat. #3180
18.	Cable Stripper, IDEAL #3/16"-5/16"**	cat. #118-584

TOOLS VENDOR:

* Cooper Tools, PO Box 728, Apex NC, 27502, (919)362-7510 catalog no. 55171

** Contact East Inc., 335 Willow Street, North Andover, MA 01845-5995, 1993 General Catalog, (508)682-2000

*** Marshall Catalog Co., Toll Free 1(800)522-0084

**** Nolan Supply, 115 Leo Ave., Syracuse, NY, (315)463-6241

SPECIAL TOOLS:

1.	Rivet gun adaptor	Welch Allyn	T-10989
2.	Special Nut Driver	Welch Allyn	T-12669

(This tool is for removing the four case screws of the wall mount transformer. It is a Xcelite regular nutdriper p/n 4mm or equivalent which has had .75" of the tip reduced in O.D. to .235" Refer to drawing 21502664 B size Rev A for details.)

TEST EQUIPMENT for 'A' Specs:

CONTACT WELCH ALLYN TECH.SERVICES FOR INFORMATION ON TEST EQUIPMENT

1. Dielectric strength tester: ASSOCIATED HY-POT, MODEL AR404AT. Associated Research Co., 905 Carriage Park Ave. Lake Bluff, Illinois, (312)295-3312
2. Power supply;DC output:Volts 0-10, Amps 0-10, Watts 0-100 KEPCO MSK-10-10M , Kepco Inc., 131-38 Sanford Ave., Flushing, NY, 11352, (718)461-7000
3. Current leakage tester circuit as described in A spec. must be used in conjunction with volt meter with an input impedance above 1 megohm: item #15 ABOVE

APPENDIX FF CONTINUED

4. Illuminance meter: MINOLTA T-1, Item# 1519-206
Minolta Corp.,101 Williams Drive, Ramsey, NJ,
(201)825-4000

SUPPLIES:

Item:	Description:	W/A Part #:
1.	Dow 111 grease (gooseneck bottom)	PN M11379
2.	MolyKote 33 grease (gooseneck top)	PN M11041
3.	Locktite #262-31	PN M30328
4.	(Transformer) Cover (to base) rivets	PN 106125-1
5.	Transformer (to cover) rivets	PN 106125-2

APPENDIX GG
PRODUCT UP-DATES

FILE ALL UP-DATES IN THIS SECTION. MAKE THE APPROPRIATE CHANGES IN THE MANUAL PERTAINING TO THESE UP-DATES.

APPENDIX HH
PRODUCT DESCRIPTION LS100

The LS100 Halogen Light is a non-stationary floor standing light. It is used for routine medical examinations and as such has a flexible 'gooseneck' which facilitates whole-body examination. The light housing is manufactured of injection molded plastic which minimizes surface temperature. The power source for the LS100 is standard A.C. for the country it is sold into. Different source voltages and frequencies are accommodated by manufacturing the LS100 with either of two basic transformers, and the appropriate plug configuration. These are the only differences between the six different model numbers of the LS100. The secondary, or lamp voltage is 12 v.a.c.. All models use the same 20 watt halogen lamp PN06300. Lamp current is switched by Single Pole Single Throw (spst) switch. The transformer however, is energized as long as the power plug is connected to a power source.

Please refer to the Owner's Manual WA pn440001-1 for information on "Set-Up and operation".

This product is designed and manufactured to strict specifications and safety regulations for medical products, and should be serviced only by Welch Allyn trained technicians.